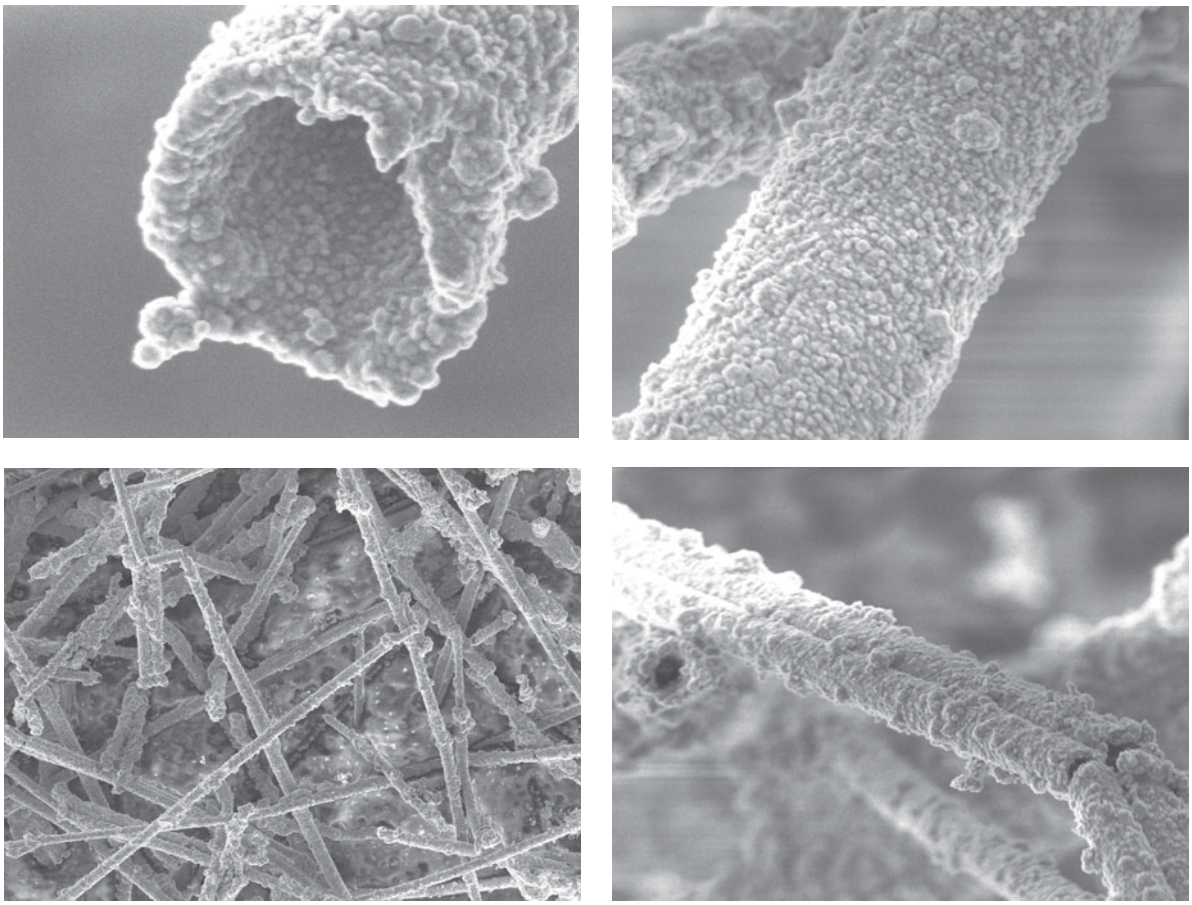

Copper-plated Lipid Tubules

These are scanning electron micrographs (SEMs) of diacetylenic lipid tubules coated electrolessly with copper. The lipid is a modified version of the material found in cell membranes. The tubules are hollow, and are 1 to 2 μm in diameter and about 30 μm long. The electroless coating of copper reinforces the tubules and renders them highly electrically conductive. The high-resolution photos show that the copper is formed of small grains, 30 to 100 nm in size, grown together to a thickness of about 300 nm, covering both the interior and exterior walls of the tubule.